It's The Law . . .

MEASURING COST, SCHEDULE, PERFORMANCE, AND SUPPORTABILITY

Roger D. Hamerlinck

Introduction

On Feb. 27, 2000, Paul J. Hoeper, then Assistant Secretary of the Army for Acquisition, Logistics and Technology, signed the following policy:

"*The Department of the Army holds supportability to be co-equal in importance with the materiel development considerations of cost, schedule and performance. Accordingly, it is incumbent upon everyone involved in the acquisition and logistics processes to ensure that system supportability is fully addressed throughout the development, acquisition, fielding, and utilization of the system. AR [Army Regulation] 700-127, Integrated Logistics Support, provides Army policy on supportability planning and execution.*"

Public law and federal policies such as the Government Performance and Results Act of 1993 and the National Partnership for Reinventing Government (formerly known as the National Performance Review) require governmental agencies to develop strategic plans, performance measures, annual performance plans, and performance reporting procedures.

In keeping with the above guidance, it is imperative that a supportability performance measurement system be developed and implemented. The initial steps have been taken in the development of DOD and Army strategic logistics strategies. These documents contain strategic-level goals, objectives, and metrics such as optimizing cycle times, attaining a specific percentage of mission-capable rates, improving strategic mobility, implementing customer wait time, fully implementing joint total asset visibility, re-engineering and modernizing applicable logistics processes and systems, and reducing weapon system logistics support costs.

Performance Measurement

According to author and consultant H. James Harrington, "Measurement is the first step that leads to control and eventually to improvement; if you can't measure something, you can't understand it; if you can't understand it, you can't control it; if you can't control it, you can't improve it."

Authors and educators have provided numerous models for use in developing and implementing a performance measurement system. Some of the more popular models are: *The Balanced Scorecard*, by Drs. Robert Kaplan and David Norton; *The Performance Pyramid*, by Kelvin F. Cross and Richard L. Lynch; and *The Supply-Chain Operations Reference Model*, by the Supply-Chain Council. Each of these models, while different in nomenclature and number of steps in the process, has similar characteristics. Each relates the measurement system to the organizational mission, vision, values, and strategy. Each identifies key success factors (KSFs), drivers, and enablers related to the organizational mission, vision, values, and strategy. Each defines the "few" critical performance metrics, or indices, that will serve as the best indicators of performance against the goals and objectives that were determined to be critical to success. Finally, each emphasizes the importance of continually re-evaluating performance measures and to taking corrective action as required. Although these authors recommend different formats and content, they all agree on the importance of combining these characteristics into a performance measurement plan (PMP). The PMP is a tool that helps define and manage a performance measurement system.

Supportability

MIL-HDBK-502, *Acquisition Logistics*, defines supportability as " the degree to which system design characteristics and planned logistics support resources meet system peacetime and wartime requirements. Supportability is the capability of a total system design to support operations and readiness needs throughout the system's service life at an affordable cost. It provides a means of assessing the suitability of a total system design for a set of operational needs within the intended operations and support environment (including cost constraints)."

When integrated logistics support (ILS) management and supportability analyses are properly applied in the systems engineering process, the result should be a balance between the designs of the materiel system and the supportability structure. Balance is achieved by performing trade-off analysis and fact-based decisionmaking. The word balance is used to show the interrelationship and interdependency between cost, schedule, performance, and supportability. A performance requirement for a specified reliability level will

impact the cost, schedule, and supportability parameters of that same system. Therefore, trade-offs between these four elements are required to find the optimum mix of design, affordability, and supportability.

The ILS management process, as defined by AR 700-127, *Integrated Logistics Support (ILS)*, is characterized by 10 elements (see figure): maintenance planning; support equipment; supply support; computer resources support; manpower and personnel; facilities; packaging, handling, storage, and transporting; technical data; training and support training; and design influence.

Performance Metrics

The Army ILS Executive Committee concluded that performance metrics were needed for each of the ILS elements and provided a list of metrics that would indicate the level of performance for each element. This listing can be found in DA Pamphlet 700-56.

If each of the ILS elements is considered a KSF, then it is relatively easy to develop a basic supportability PMP. The benefit of such a format for the PMP is that it provides a complete map of the critical processes and their associated measures. It also complements the contents of several of the other program executive office and program management documents (i.e., Acquisition Program Baseline, Operational Requirements Document, Acquisition Strategy, Test and Evaluation Master Plan, Supportability Strategy, Program Work Breakdown Structure, Statement of

SUPPORTABILITY PERFORMANCE MEASUREMENT PLAN

System: _____

Life Cycle Phase: _____

Decision Level: _____

ILS ELEMENT	PROCESS OR ACTIVITY	PROCESS OWNER	PERFORMANCE MEASURE	DATA COLLECTION METHOD	FREQUENCY	LINK TO CRITICAL SUCCESS FACTOR
Maintenance Planning						
Support Equipment						
Supply Support						
Computer Resources Support						
Manpower and Personnel						
Facilities						
Packaging, Handling, Storage, and Transporting						
Technical Data						
Training and Support Training						
Design Influence						

Work, and Modified Integrated Program Summary).

Although most of the headings of the PMP are self-descriptive, a few require some additional comments. The *Life Cycle Phase* is important because the measures will change over the course of the life cycle. It is likely one would require a PMP for each phase of the life cycle. The *Decision Level* of the PMP refers to the strategic, operational, or tactical metrics. The selected *Performance Measure* will vary according to the decision level. Strategic-level metrics come from the DOD and Army strategic logistics strategies (i.e., a 20-percent reduction in the total ownership cost of a given system). Operational-level metrics come from program management documents and DOD and Army regulations and pamphlets (i.e., mean time between failure, order ship time, and administrative lead time/procurement lead time). The tactical-level metrics come from Army, major command, and major subordinate command regulations and policies (i.e., retail-level supply, maintenance, and transportation data).

Critical Factors

No single organization, individual, or manager can give attention to hundreds or even thousands of different performance measures. When there are multiple performance measures, they should be consolidated into groupings that cover a broader area. These groupings are called critical success factors (CSFs). These CSFs must be displayed so that management and employees can interpret them and react appropriately. Additionally, there should be no more than 6-12 CSFs.

An example of a familiar performance measurement system made up of CSFs can be found on the dashboard of a car. Drivers only need a few critical pieces of information to safely operate their vehicles. The fuel gauge, speedometer, engine gauge, odometer, and some key warning lights provide this information.

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A system's supportability performance is based on several CSFs. The focus is on seven performance metrics, an earned value graphic, and a list of "warning lights." The seven core supportability metrics are: availability/supportability, cost, schedule, technical performance, asset visibility, customer wait time, and manpower and personnel. Supportability cannot be fully measured by one single metric because balance is required. For example, if a 99-percent availability/supportability rate is reported, but that rate caused higher costs or additional manpower, a manager could begin to make informed decisions. Additional investigation might show that the 99-percent rate caused no increase in performance compared to a 97-percent rate. The manager must decide if the increase in availability is worth the increase in manpower.

When the seven core metrics are visible, a manager can balance between them. The earned value graphic allows the manager to see the plan, to determine what performance has been against the plan, and to see future projections. The warning lights are used to indicate potential problems. For example, a late contract delivery that affects the schedule and cost may be a warning light. Another example might be when there has been a decrement in a specific appropriation impacting one of the supportability characteristics.

Conclusion

Not only is measuring supportability required by law, it is sound business practice. The future success of the Army is dependent on achieving an acceptable mix between highly reliable designs and effective and efficient support structures. As a reminder of how critical the issue of supportability is to mission accomplishment, consider the following rhyme: "For want of a nail, the shoe was lost; For want of the shoe, the horse was lost; For want of the horse, the rider was lost; For want of the rider, the battle was lost; For want of the battle, the kingdom was lost, And all for the want of a nail."

ROGER D. HAMERLINCK is a Senior Logistics Analyst with Logistics & Environmental Support Services Corp. working in support of the Deputy Assistant Secretary of the Army for ILS, Washington, DC. He holds a B.S. in business from Upper Iowa University and an M.B.A. from California Coast University.
